

NOISE/NEWS

INTERNATIONAL

Volume 30, Number 1
2022 March

*A quarterly news magazine
and online digital blog published
by I-INCE and INCE-USA*

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Noise as a Business Model

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No other class of vehicles embodies the conflict between sound and noise as much as motorcycles – possibly with the exception of sports cars and oldtimers. The same fluctuations of pressure the rider of the motorcycles perceives as powerful sound is felt as infernal noise by many living alongside roads. While riders insist on their freedom, noise plagued residents fear for their health and wellbeing.

The debate is highly emotional. But who is to blame and how could the conflict be healed? The solution could be as simple as building low-noise motorcycles driven by considerate riders. While this may sound naïve to you it is exactly the strategy currently followed. The formal frame work in place to guarantee that (new) motorcycles are low-noise is the worldwide harmonized UNECE type approval scheme: Each time a manufacturer wishes to bring a new motorcycle to market he

has to conduct a series of type approval tests to demonstrate that the new type complies with the limit values for sound. And representatives of the rider community regularly appeal to their fellow members to practice a moderate and considerate driving style.

So are we on track to solve the problem? By no means, unfortunately not! With an increasing number of motorcycles on the roads the number of complaints is also on the rise. And it is not only the sheer number of motorcycles that increases, but also the excessive noise of individual vehicles. The German Environment Agency (UBA) took this as a starting point to ask: Is the current type approval test for motorcycles suitable to prevent that brand-new motorcycles are (ab)used to produce infernal noise? To answer this question UBA commissioned a study (UBA 2020) to explore the acoustics of three motorcycles



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on an official test track in Germany: a Harley-Davidson Softail Heritage Classic, a BMW R NineT Urban G/S, and a Kawasaki Ninja ZX 10R KRT thus covering a broad range of engine designs. The motorcycles had been homologated according to UNECE-R41.04. They were first subjected to the corresponding approval tests including the “Additional Sound Emission Provisions” (ASEP). As expected all three motorcycles complied with the type approval sound limits. Next, the test drivers were asked to “play” with the vehicles to explore their “acoustic potential”. At operating conditions outside the control range of the type approval test, the test drivers managed an increase in the maximum pass-by sound pressure level (SPL) of between 14 to 20 decibels (dB) compared to the single highest SPL measured in the type approval test. Or in a more illustrative form: a difference of 20 dB corresponds to a factor of 200, i.e. a single motorcycle “pushed hard” can be as noisy as 200 identical motorcycles together under type approval conditions. To be sure: The motorcycles were not tuned or manipulated in any way, but rather in an “off the assembly line” condition. This manifests the point often reported by riders: In contrast to former times there is no longer any “need” to manipulate a motorcycle, good sound nowadays comes ex factory. In an additional set of measurements, after market replacement exhausts (RESS) were mounted on the motorcycles and all previous measurements were repeated. Two of the RESS were nearly undistinguishable in their acoustic behavior from the corresponding OEM systems while one raised the SPL in the worst case test by 5 dB. One of the RESS featured an easily removable “dB-eater”. Removing this part – in legal terms an act of manipulation – raised the maximum SPL by another 9 dB. A graphic summary of these test results is presented in Figure 1 and Figure 2.

Where does that leave us? The measurements clearly demonstrate that the current type approval test (aka UNECE R41.04) cannot prevent that a motorcycle, which passes the approval test and complies to the approval limits, can later be driven on public roads in a way to produce excessive noise. The central questions is: Is such an acoustic behavior “natural” and unavoidable or is it rather the intended result of sound design by the vehicle manufacturer? We maintain that the latter is the case.

While not all motorcycles are designed to emanate power, a fair portion of the motorcycle market is affected just like the segment of sports cars among 4-wheeled vehicles. The vehicles in these segments are marketed and advertised as having a particularly emotional and supposedly sporty sound. By use of valves in the exhaust stream and active sound generators more or less any desired acoustic behavior can be achieved. As a result the vehicles meet the type approval limits and nevertheless empower the driver to emit excessive noise in real

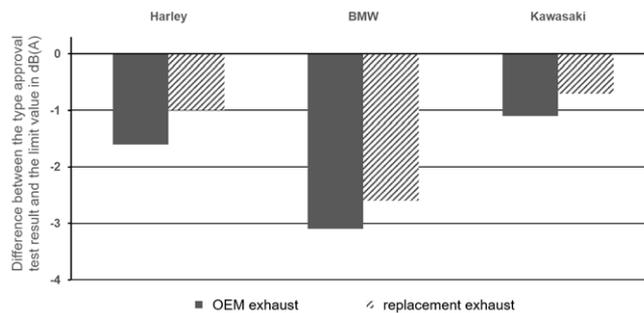


Figure 1: Compliance with UNECE R41.04. Difference between the type approval test result and the limit value

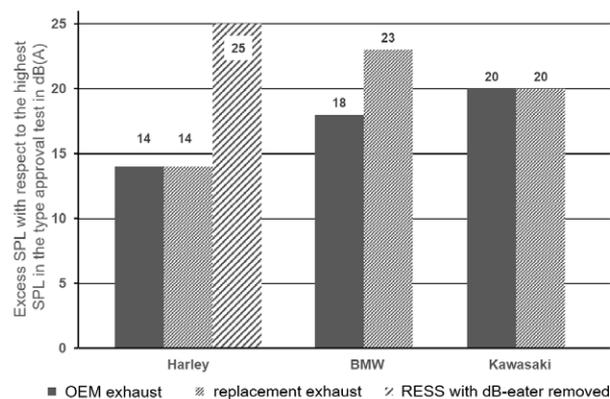


Figure 2: Noise potential of three motorcycles. Difference between the highest SPL outside the type approval control range and the highest SPL within the type approval control range

traffic. A recent UNECE document (IWG-ASEP, 2021) confirms this for cars: “The technologies currently used in systems for noise reduction in motor vehicles of classes M1 and N1 (e.g. flap silencer systems, sound actuators) allow free shaping of the vehicle sound emissions.”

Why have UNECE bodies consistently failed in the recent 30 years to put in place proper approval tests without substantial loopholes? Looking at the parties and stakeholders involved in the UNECE process readily reveals the answer: The foundations for the approval tests are laid by the International Standards Organization (ISO), an industry dominated body. At UNECE the contracting parties write the approval tests on the basis of these ISO standards and under massive influence by the vehicle manufacturers’ lobby. While the manufacturers’ lobby is not to blame that there is no substantial lobby for the many citizens heavily burdened by traffic noise, it must be considered a fact that the urgent interests of those citizens have hardly any advocate in the UNECE process for noise limits for road vehicles. In a nutshell the vehicle manufacturers set their own type

approval rules and ensure that loopholes in these rules allow them to operate their business model with excessive noise.

In light of the above it is either naïve or cynical to demand that UNECE should close the loopholes in the type approval test. If we wish to set the course for socially responsible low-noise mobility we have to require and enforce the principle that vehicles be build to be as low-noise as the state of art allows thus putting an end to noise-enhancing technologies and sound design at the expense of public health. There is no lack of knowledge or technology, there is a lack of political will to protect us all from excessive noise!

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